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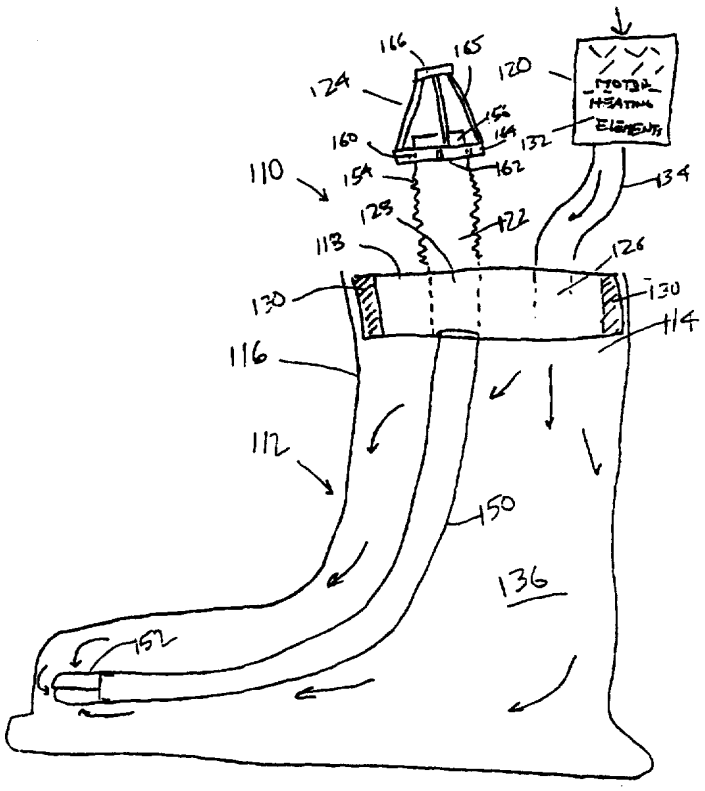
(54) Title: METHOD AND APPARATUS FOR DRYING FOOTWEAR AND HANDWEAR

(57) Abstract

A method and apparatus for delivery of air to coverings for a human extremity for the purposes of drying and warming the same. In one embodiment of the apparatus, the air is first accumulated in a plenum before delivery to the covering through a tube. In another embodiment, the apparatus has a seal at the opening of the boot or glove. The seal has an inlet port and an exhaust port. The exhaust port receives a flexible return air duct that leads to an interior extremity of the boot or glove. The exterior portion of the exhaust ports have risers with diffusers where gloves may be mounted for drying and warning purposes. The inlet port attached to a fan device in front of a downstream heating element. In accordance with this invention, air is forced through the entire boot, insuring that all areas within the boot are warmed and dried.



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Description

METHOD AND APPARATUS FOR DRYING FOOTWEAR AND HANDWEAR

Technical Field

The present invention relates to methods and apparatus for drying boots such as ski boots, and more particularly, to method and apparatus for drying footwear and handwear by compressing a fluid in an ambient atmosphere and directing it into a conduit for transmission through the interior volume of the footwear or handwear to a distal portion of the footwear or handwear.

The present invention is particularly relevant to methods and apparatus for portably drying footwear and handwear.

Background of the Invention

It is well-known that it is helpful to dry and warm footwear and handwear both before and after use and, accordingly, several proposed solutions to the problem have been posed. Several devices have been patented for the drying and warming of footwear by blowing a stream of air into the footwear. The prior art is typified by United States Patent Nos. 2,299,529, 4,145,602, 4,171,580 and 4,768,293. At least some of the known prior art references fail to direct or blow air to the toe of the boot that is being dried. Also, the prior art devices do not insure the heating or drying of the entire boot by allowing the drying air to rise freely out of the boot collar.

In general, the difficulties and disadvantages of the prior art include apparatus that are bulky, complex, and subject to thermal and aerodynamic inefficiencies due to complex manifolding and inefficient fan design. Among other disadvantages, the devices described in the known prior art are not truly portable, since they constitute an additional piece of luggage. Additionally exemplary of such inefficient designs is the disclosure of United States Patent No. 5,287,636.

The prior art also discloses apparatus and methods that are difficult to operate because they require the item to be dried after being balanced unnaturally on its heel (also shown in United States Patent No. 5,287,636), or they require unused ports

on a manifold to be shut off to get sufficient air flow due to fan designs as seen in the previously-discussed prior art.

Further, the disclosures of the prior art show devices that are able to dry only a limited number of articles at a given time, or are able to dry only one kind of article (such as boots) at a time. Also, some disclosed apparatus intended to dry gloves provide only inadequate space for exit air and hence have virtually no circulation of drying air. This implies that the disclosed items provide poor drying action.

Many of the known examples of the prior art use hair dryers that operate at unsuitably high temperatures, while the others have fixed temperatures and motor speeds. This prevents the user from adjusting temperature and motor speed, so that the drying speed, ambient noise and temperature requirements may not be met.

The entire body of the prior art of which the present inventor is aware fails to recognize the need to control temperature and air volume or motor noise in accordance with clothing materials and conditions, ambient conditions, and operator preferences.

Summary of the Invention

An object of the present invention is to provide a compact drying device for multiple articles of clothing in naturally balanced positions, the drying device being both aerodynamically and thermodynamically efficient. A further object of the present invention is to provide temperature and blower controls which accommodate a wide range of clothing materials and levels of water saturation, in addition to ambient noise and temperature levels.

According to one aspect, the invention is an apparatus for drying the interior of a covering for a human limb. The covering has an opening leading to an interior volume containing a gas, and the interior volume has a distal portion. The apparatus comprises a conduit and a compressor.

The conduit has an inlet end and an outlet end. The conduit passes through the interior volume to the distal portion so that the inlet end is outside of the covering and the outlet end is at the distal portion of the covering. The compressor is connected to the inlet end of the conduit, and compresses fluids in the

ambient atmosphere and directs them into the conduit for transmission through the interior volume to the distal portion of the covering.

According to another aspect, the invention is a method for drying interior of a covering for a human limb. The covering has an opening leading to an interior volume containing a gas, and the interior volume has a distal portion. The method includes the steps of a) providing a conduit having an inlet end and an outlet end, and b) passing the conduit through the interior volume to the distal portion so that the inlet end is outside of the covering and the outlet end is at the distal portion of the covering. The method also includes c) compressing fluids in the ambient atmosphere, and d) directing the compressed fluids into the conduit for transmission through the interior volume to the distal portion of the covering.

According to a further aspect, the invention is an apparatus for drying the interior of a covering for a human limb. The covering has an opening leading to an interior volume containing a gas. The interior volume has a distal portion. The apparatus includes conduit means, means for compressing fluids and means for directing fluids. The conduit means is for conducting a fluid therethrough, and has an inlet end and an outlet end. The conduit means passes the conduit through the interior volume to the distal portion so that the inlet end is outside of the covering and the outlet end is at the distal portion of the covering. The means for compressing fluids compresses fluids in the ambient atmosphere. The means for directing the compressed fluids into the conduit passes through the interior volume to the distal portion of the covering.

A further object of the present invention is to pressurize and control the flow of warm or cool air through a boot for the purposes of drying and warming while simultaneously drying and warming gloves or mittens. The apparatus includes a seal (with or without an adapter ring which is boot size dependent). The seal, which is located in the ankle portion of the boot, has an inlet port and an exhaust port.

According to a further aspect, the invention is an apparatus for drying the interior of a covering for a human extremity. The apparatus has an opening for insertion of the extremity

therethrough.

The apparatus includes a compressor, a manifold, and a plurality of conduits. The compressor has access to the ambient atmosphere surrounding the covering, and the ambient atmosphere has an ambient pressure. The compressor is adapted to compress a gas from the ambient atmosphere to a static pressure greater than the ambient pressure. The manifold has an internal volume, and is adapted to receive the compressed gas from the compressor at the static pressure and to distribute the compressed gas to a plurality of orifices formed in the manifold. Each of the plurality of conduits has a first end connected to a distinct one of the plurality of orifices and a second end connected to a distinct diffuser. By this configuration each of the plurality of conduits can direct a flow of the compressed gas in a plurality of directions relative to the second end of the conduit, the conduits being adapted for insertion into the covering.

In accordance with a still further aspect, the invention is a method for drying the interior of a covering for a human extremity having an opening for insertion of the extremity therethrough. The method includes the steps of a) supplying a compressor having access to an ambient atmosphere, and b) supplying a manifold adapted to receive the compressed gas from the compressor at the static pressure and to distribute the compressed gas to a plurality of orifices through an internal volume formed in the manifold. The ambient atmosphere has an ambient pressure surrounding the covering. The compressor is adapted to compress a gas from the ambient atmosphere to a static pressure greater than the ambient pressure. The method also includes the step of c) supplying a plurality of conduits, each of the conduits having a first end connected to a distinct one of the plurality of orifices and a second end connected to a distinct diffuser to direct a flow of the compressed gas in a plurality of directions relative to the second end of the conduit, the conduits being adapted for insertion into the covering.

In accordance with yet another aspect, the invention is an apparatus for drying the interior of a covering for a human extremity having an opening for insertion of the extremity therethrough. The apparatus includes compressor means, manifold

means, and a plurality of conduit means. The compressor means is for compressing a gas from the ambient atmosphere to a static pressure greater than the ambient pressure of the ambient atmosphere surrounding the covering. The manifold means is for receiving the compressed gas from the compressor means at the static pressure and for distributing the compressed gas to a plurality of orifice means through an internal volume formed in the manifold means. The plurality of conduit means each has a first end connected to a distinct one of the plurality of orifice means and a second end connected to a distinct diffuser means for directing a flow of the compressed gas in a plurality of directions relative to the second end of the conduit means. The conduit means is adapted for insertion into the covering.

Brief Description of the Drawings

Figure 1 is a vertical cross-sectional view of a first preferred embodiment of the present invention as it is used to dry footwear, such as a ski boot.

Figure 2 is a vertical cross-sectional view of the first preferred embodiment of the present invention as it is used to dry handwear, such as a ski glove.

Figure 3a is a transverse view of a diffuser according to the first preferred embodiment of the present invention.

Figure 3b is a longitudinal view of a diffuser according to the first preferred embodiment of the present invention.

Figure 4 is a general perspective view of the first preferred embodiment of the present invention.

Figure 5 is vertical cross-sectional view of a second preferred embodiment of the apparatus of the present invention.

Figure 6 is detailed cross-sectional view of a third preferred embodiment of the apparatus of the present invention.

Detailed Description of the Preferred Embodiments of the Invention

As will be described in greater detail subsequently, the present invention is a footwear and handwear drying apparatus that includes a central plenum for the delivery of hot or cold air. The plenum has two ends. One end of the plenum is terminated with a wall or similar termination, and the other end of the plenum contains an integrated turbine compressor-type fan and a heating element. The invention delivers hot or cold air in adequate quantities to complete the desired drying and/or warming. A number of flexible tubes are attached to a forward surface of the plenum, facilitating air delivery to the toes of each of the boots. A diffuser at the toe end of each of the air delivery tubes prevents them from becoming totally blocked and also diffuses the air delivered to the toe.

From the top end of the plenum, extend a number of tubes (either rigid or flexible) that deliver air to handwear. Diffusers are also attached to the handwear-drying tubes. The handwear diffusers allow air into the interior of the handwear by passing up its center and expanding the handwear to permit easy flow of exhaust air, thereby creating a drying circulation of air inside the handwear.

All controls are mounted in the central plenum. The controls include a timer switch, a heat on/off switch and a voltage controller to provide continuously-variable control over the motor speed and the heat levels.

Figure 1 is a vertical cross-sectional view of a first preferred embodiment of the present invention as it is used to dry footwear, such as a ski boot. The boot 10 is defined by the position and location of a surface 12. The boot 10 has a heel portion 14 which is disposed directly below an opening 16 intended to be occupied by the wearer's ankle when the boot 10 is being worn.

Figure 2 is a vertical cross-sectional view of the first preferred embodiment of the present invention as it is used to dry handwear, such as a ski glove. The glove 20 is defined by an outer covering 22, and has a wrist opening 24 located oppositely a finger portion 26.

Figure 3a is a transverse view of a diffuser according to

the first preferred embodiment of the present invention, and Figure 3b is a longitudinal view of a diffuser according to the first preferred embodiment of the present invention. As discussed above and described in Figures 1 and 2, both the boot 10 and the glove 20 have an opening (16 and 24, respectively) for insertion of an air duct 34 and a diffuser 36. The air duct 34 intended for placement in the glove 20 is attached to the glove diffuser 36. The glove diffuser 36 has an inner ring 37 which fits snugly around and near the end of the air duct 34 and from which radial spokes 38 project transversely outward to a first circumferential band 40. The upper surface of the first circumferential band 40 serves to support a number of supports 41 which converge upwardly to a smaller circumferential band 42, thereby creating a tapered and vented mandrel on which the cuff or gauntlet portion of the glove 20 is expanded, thereby allowing for the free flow of air into and out of the glove 20. The glove mandrel is positioned in accordance with the mounting configuration of the central plenum of the invention, as will be discussed subsequently.

Figure 4 is a general perspective view of the first preferred embodiment of the present invention. The drying apparatus 60 includes a base 62 and a central plenum 64. The central plenum 64 is attached to and supported above the base 62 by two or more support rods 66 at a height that is convenient for use of the apparatus 60. The central plenum 64 is a generally cylindrical volume having either a rectangular or circular cross-section and opposed first and second ends 68 and 70. A number of the air tubes 34 (as described in Figures 3a and 3b) project upwardly from an upper surface of the central plenum 64, and a number of air tubes 72 project downwardly from a forward surface of the central plenum 64. The air tubes 72 each have a diffuser 74 (similar to the diffusers 36 described in Figures 3a and 3b) attached near their outer ends.

The first end 68 of the drying apparatus 60 is the location of a number of controls. These controls include an on/off switch 76, a motor speed control 78 and a heater control 80. The on/off switch 76 receives electrical power through a conventional power cord (not shown) which is connected to a wall socket, and is operated to provide electrical power to other electrical circuitry in the drying apparatus 60.

The second end 70 of the drying apparatus 60 is the location of an electrical motor 82 and an electrical heater 84. The electrical power to the electrical motor 82 is controlled by the motor speed control 78, and the electrical power to the electrical heater 84 is controlled by the heater control 80.

After activation of the on/off switch 76 and of the motor speed control 78, the electrical motor 82 operates a fan located in the second end 70 to draw air into the central plenum 64, pressurizing the central plenum 64 and supplying air through each of the air tubes 34 and 72 and their respective diffusers 36 and 74. The capacity of the electrical motor 82 and the fan that it powers is chosen in accord with conventional engineering practices to provide an ample supply of air to the central plenum 64 so that each of the air tubes 34 and 72 can provide a continuous stream of air through its corresponding diffuser 36 and 74, regardless of whether an air tube 34 or 72 and corresponding diffuser 36 or 74 is respectively placed in a glove or boot, or not.

After activation of the on/off switch 76 and of the heater control 80, the electrical heater 84 is controlled by the heater control to control the temperature of the air supplied to the central plenum 64 by the electrical motor 84 and the fan.

In operation, the drying apparatus 60 is used by being connected to an electrical wall socket, operation of the on/off switch 76, the motor speed control 78, and the heater control 80. This results in a supply of forced, heated air to the central plenum 64 and to the respective air tubes 34 and 72. Any gloves or boots placed over the air tubes are given a supply of air to their interiors, drying and/or heating the gloves or boots for subsequent use.

The second and third preferred embodiments of the present invention eliminate the shortcomings and disadvantages of the prior art for drying and warming of boots and handwear. The present invention is sized and designed to be packed within the interior of a boot while being transported and at the same time fitting the full range of boot sizes. Further, the inventive apparatus can be adjusted so that desired heating and air flow conditions can be created, thereby matching the conditions to the boot and handwear materials, ambient conditions and personal

preferences.

Figure 5 is a vertical cross-sectional view of a second preferred embodiment of the apparatus of the present invention, and Figure 6 is a detailed cross-sectional view of a third preferred embodiment of the apparatus of the present invention. The apparatus 110 can preferably take the form of a portable unit that is used in connection with a ski boot or similar footwear 112. The footwear 112 has an opening 114 in the upper ankle portion 116.

The apparatus 110 includes a seal 118, a compressor 120, an exhaust tube 122, and a diffuser 124. The seal 118 is received by the opening 114 of the footwear 112, which it entirely closes except for the intake port 126 and the outlet port 128. The seal 118 can include an adapter ring 130 which seals large size footwear by being placed circumferentially outside the main portion of the seal 118.

The compressor 120, which can include heater coils 132, is attached to a tube(s) 134 which is connected to the intake port 126 of the seal 118. Therefore, the compressor 120 takes in air from the ambient atmosphere (and possibly heats it), compresses the air, and directs it to the intake port 126 through the tube 134. Alternatively, the compressor 120 can be made integral with the seal 118.

Regardless of whether the compressor 120 is integral with he seal 118, the air introduced to the interior of the footwear 112 enters the entire volume 136 of the footwear 112. As the air which has entered the footwear 112 is pressurized relative to the ambient atmosphere, it eventually exhausts through the outlet port 128. As the air passes through the footwear 112 before being exhausted from the footwear 112, it passes by all of the internal surfaces of the footwear 112. To assure that the air passes through the most extreme portion of the volume 136 of the footwear 112, a tube 150 connects the toe portion of the footwear 112 to the outlet port 128. The tube 150 is preferably a flexible corrugated tube. To further ensure that the airflow in the volume 136 of the footwear 112 draws from all portions of the volume 136, the distal end of the tube 150 has a connected diffuser tip 152. The diffuser tip 152 draws air from virtually all directions.

The air forced from the volume 136 of the footwear 112 exits the outlet port 128 and passes into a flexible corrugated tube 154 which is part of the exhaust tube 122 and is connected to the outlet port 128. The upper end 156 of the flexible tube 154 is connected to the diffuser 124 which causes the air exhausted from the volume 136 of the footwear 112 to be dispersed in many directions within any glove 157 in which the diffuser 124 may be placed. This ensures the more effective drying of the glove 157. Also, the compressor 120 can be located so that it takes in air below the glove 157, causing the air to pass by the outer surface of the glove 157 before entering the compressor 120, further improving drying the glove 157. To promote the dispersive action of the diffuser 124, it includes a narrow diameter ring 160 which fits around the flexible tube 154. A series of radial spokes 162 extend from the ring 160 to a larger diameter ring 164. From an upper surface of the ring 164 a series of thin inwardly-angled supports 165 lead to a smaller diameter ring 166. This construction of the diffuser 124 ensures that the gauntlet of the glove 157 is held upon so that the air flow is well dispersed in any glove 157 within which it is placed.

As shown in Figure 6, in the third preferred embodiment of the invention, a single compressor 120 can be used to convey air into more than one footwear 112 at a time.

While the foregoing is a detailed description of the preferred embodiment of the invention, there are many alternative embodiments of the invention that would occur to those skilled in the art and which are within the scope of the present invention. Accordingly, the present invention is to be determined by the following claims.

Claims

1. An apparatus for drying the interior of a covering for a human limb, the covering having an opening leading to an interior volume containing a gas, the interior volume having a distal portion, the apparatus comprising:

a conduit having an inlet end and an outlet end, the conduit passing through the interior volume to the distal portion so that the inlet end is outside of the covering and the outlet end is at the distal portion of the covering; and

a compressor connected to the inlet end of the conduit, the compressor compressing fluids in the ambient atmosphere and directing them into the conduit for transmission through the interior volume to the distal portion of the covering.

2. The apparatus of claim 1 wherein the compressed fluids transmitted to the distal end of the covering are decompressed in the distal portion of the covering and are thereafter transmitted from the distal portion through the interior volume and the opening to the ambient atmosphere.

3. The apparatus of claim 2, further comprising a flow director connected to the outlet end of the conduit for directing the compressed fluids to a plurality of sections of the distal portion of the covering, the plurality of sections being located in a plurality of directions from the outlet end of the conduit.

4. The apparatus of claim 1 wherein the covering is a foot covering, the apparatus further comprising a barrier that fits into the opening.

5. The apparatus of claim 4 wherein the barrier is connected to the conduit between the inlet and outlet ends.

6. The apparatus of claim 5 wherein the barrier allows passage of the decompressed fluid from the interior volume of the foot covering to the ambient atmosphere.

7. The apparatus of claim 1 wherein the covering is a hand covering, the apparatus further comprising a barrier that fits into the opening.

8. The apparatus of claim 7 wherein the barrier is connected to the conduit between the inlet and outlet ends.

9. The apparatus of claim 8 wherein the barrier allows passage of the decompressed fluid from the interior volume of the hand covering to the ambient atmosphere.

10. A method for drying interior of a covering for a human limb, the covering having an opening leading to an interior volume containing a gas, the interior volume having a distal portion, the method comprising the steps of:

a) providing a conduit having an inlet end and an outlet end;

b) passing the conduit through the interior volume to the distal portion so that the inlet end is outside of the covering and the outlet end is at the distal portion of the covering;

c) compressing fluids in the ambient atmosphere; and

d) directing the compressed fluids into the conduit for transmission through the interior volume to the distal portion of the covering.

11. The method of claim 10, further comprising the steps of:

e) decompressing the fluids in the distal portion of the covering; and

f) thereafter transmitting the decompressed fluids from the distal portion through the interior volume and the opening to the ambient atmosphere.

12. The method of claim 11, further comprising the step of:

g) connecting a flow director to the outlet end of the conduit; and

h) causing the flow director to direct the compressed fluids to a plurality of sections of the distal portion of the covering, the plurality of sections being located in a plurality of directions from the outlet end of the conduit.

13. The method of claim 10 wherein the covering is a foot covering, the method further comprising the step of:

e) fitting a barrier into the opening.

14. The method of claim 13, further comprising the step of:

f) connecting the barrier to the con between the inlet and outlet ends.

15. The method of claim 14, further comprising the step of:

g) allowing the passage of the decompressed fluid through the barrier from the interior volume of the hand covering to the ambient atmosphere.

16. The method of claim 13 wherein step e) includes fitting the barrier tightly into the opening.

17. The method of claim 10 wherein the covering is a hand covering, the method further comprising the step of:

e) fitting a barrier into the opening.

18. The method of claim 17, further comprising the step of:

f) connecting the barrier to the conduit between the inlet and outlet ends.

19. The method of claim 18, further comprising the step of:

g) allowing the passage of the decompressed fluid through the barrier from the interior volume of the hand covering to the ambient atmosphere.

20. The method of claim 17 wherein step e) includes fitting the barrier tightly into the opening.

21. The method of claim 10 wherein step a) includes making the conduit from an exterior portion and an interior portion, step d) includes connecting a first end of the exterior portion to an evacuator and a second end of the exterior portion to an aperture in the barrier at a second end, and connecting the interior portion to the aperture in the barrier at a first end and

extending the second end of the interior portion to the distal portion.

22. An apparatus for drying the interior of a covering for a human limb, the covering having an opening leading to an interior volume containing a gas, the interior volume having a distal portion, the apparatus comprising:

conduit means for conducting a fluid therethrough, the conduit means having an inlet end and an outlet end and passing the conduit through the interior volume to the distal portion so that the inlet end is outside of the covering and the outlet end is at the distal portion of the covering;

means for compressing fluids in the ambient atmosphere; and

means for directing the compressed fluids into the conduit for transmission through the interior volume to the distal portion of the covering.

23. An apparatus for drying the interior of a covering for a human extremity having an opening for insertion of the extremity therethrough, comprising:

a compressor having access to the ambient atmosphere surrounding the covering, the ambient atmosphere having an ambient pressure, the compressor being adapted to compress a gas from the ambient atmosphere to a static pressure greater than the ambient pressure;

a manifold having an internal volume, the manifold being adapted to receive the compressed gas from the compressor at the static pressure and to distribute the compressed gas to a plurality of orifices formed in the manifold; and

a plurality of conduits, each of the conduits having a first end connected to a distinct one of the plurality of orifices and a second end connected to a distinct diffuser to direct a flow of the compressed gas in a plurality of directions relative to the second end of the conduit, the conduits being adapted for insertion into the covering.

24. The apparatus of claim 23, wherein the compressor includes a heater for heating the gas.

25. The apparatus of claim 24, wherein the heater is adjustable so that it can change the amount by which it heats the gas.

26. The apparatus of claim 23, wherein the manifold is a truncated cylinder having a cylindrical surface, a first end and a second end, the first end being sealed and the compressor being attached at the second end.

27. The apparatus of claim 26, wherein the plurality of conduits are connected to the cylindrical surface of the manifold.

28. A method for drying the interior of a covering for a human extremity having an opening for insertion of the extremity therethrough, comprising the steps of:

a) supplying a compressor having access to the ambient atmosphere surrounding the covering, the ambient atmosphere having an ambient pressure, the compressor being adapted to compress a gas from the ambient atmosphere to a static pressure greater than the ambient pressure;

b) supplying a manifold adapted to receive the compressed gas from the compressor at the static pressure and to distribute the compressed gas to a plurality of orifices through an internal volume formed in the manifold; and

c) supplying a plurality of conduits, each of the conduits having a first end connected to a distinct one of the plurality of orifices and a second end connected to a distinct diffuser to direct a flow of the compressed gas in a plurality of directions relative to the second end of the conduit, the conduits being adapted for insertion into the covering.

29. The method of claim 28, further including the step of d) including a heater for heating the gas.

30. The method of claim 29, wherein step d) includes adapting the heater to be adjustable so that it can change the amount by which it heats the gas.

31. The method of claim 28, wherein step b) includes making the manifold in the form of a truncated cylinder having a cylindrical

surface, a first end and a second end, the first end being sealed and the compressor being attached at the second end.

32. The method of claim 31, wherein step c) includes connecting the plurality of conduits to the cylindrical surface of the manifold.

33. An apparatus for drying the interior of a covering for a human extremity having an opening for insertion of the extremity therethrough, the apparatus comprising:

compressor means for compressing a gas from the ambient atmosphere to a static pressure greater than the ambient pressure of the ambient atmosphere surrounding the covering;

manifold means for receiving the compressed gas from the compressor means at the static pressure and for distributing the compressed gas to a plurality of orifice means through an internal volume formed in the manifold means; and

a plurality of conduit means, each of the conduit means having a first end connected to a distinct one of the plurality of orifice means and a second end connected to a distinct diffuser means for directing a flow of the compressed gas in a plurality of directions relative to the second end of the conduit means, the conduit means being adapted for insertion into the covering.

34. The apparatus of claim 33, further including heater means for heating the gas.

35. The apparatus of claim 34, wherein the heater means is adjustable so that it can change the amount by which it heats the gas.

36. The apparatus of claim 33, wherein the manifold means has the form of a truncated cylinder having a cylindrical surface, a first end and a second end, the first end being sealed and the compressor being attached at the second end.

37. The apparatus of claim 36, wherein the plurality of conduit means is connected to the cylindrical surface of the manifold means.

FIG. 1

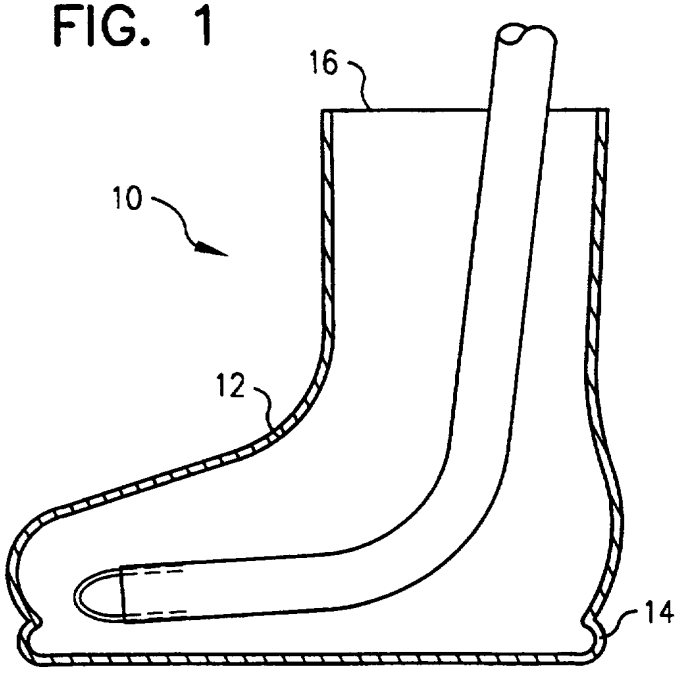


FIG. 2

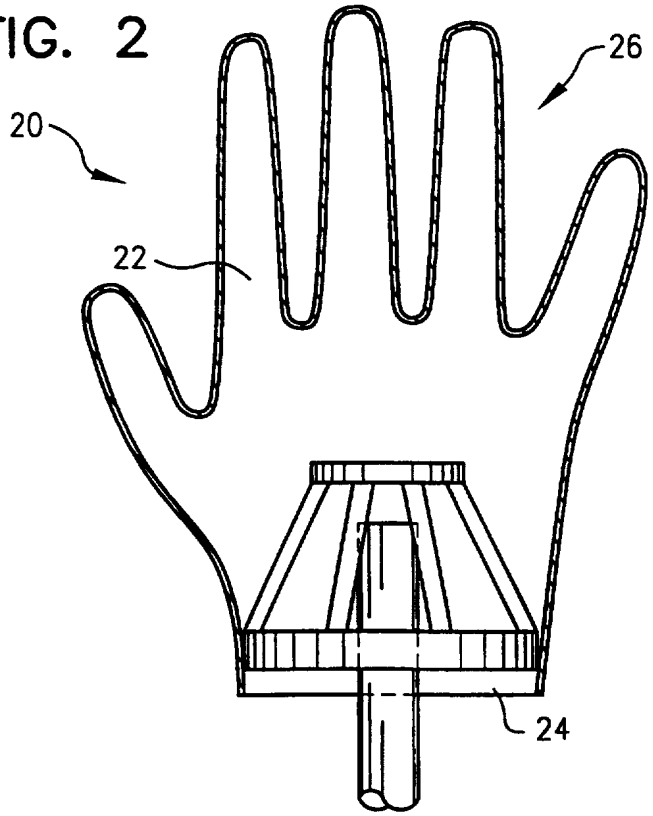
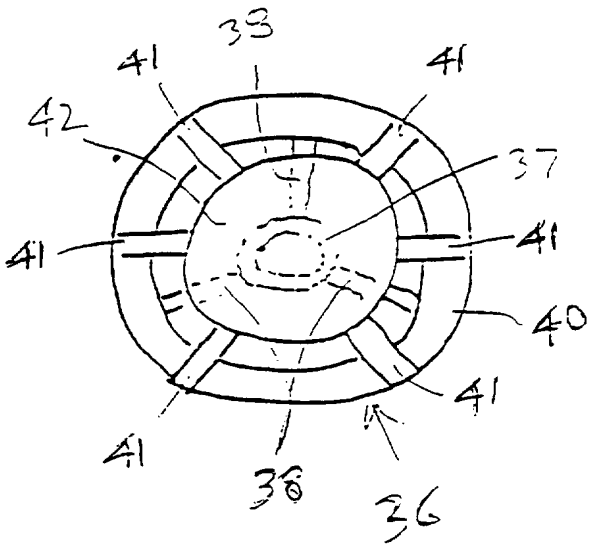


FIG. 3b



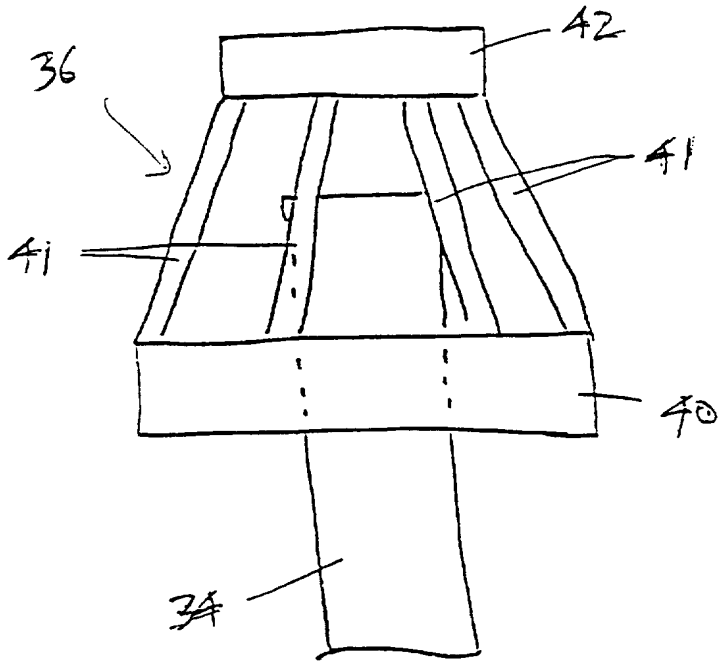
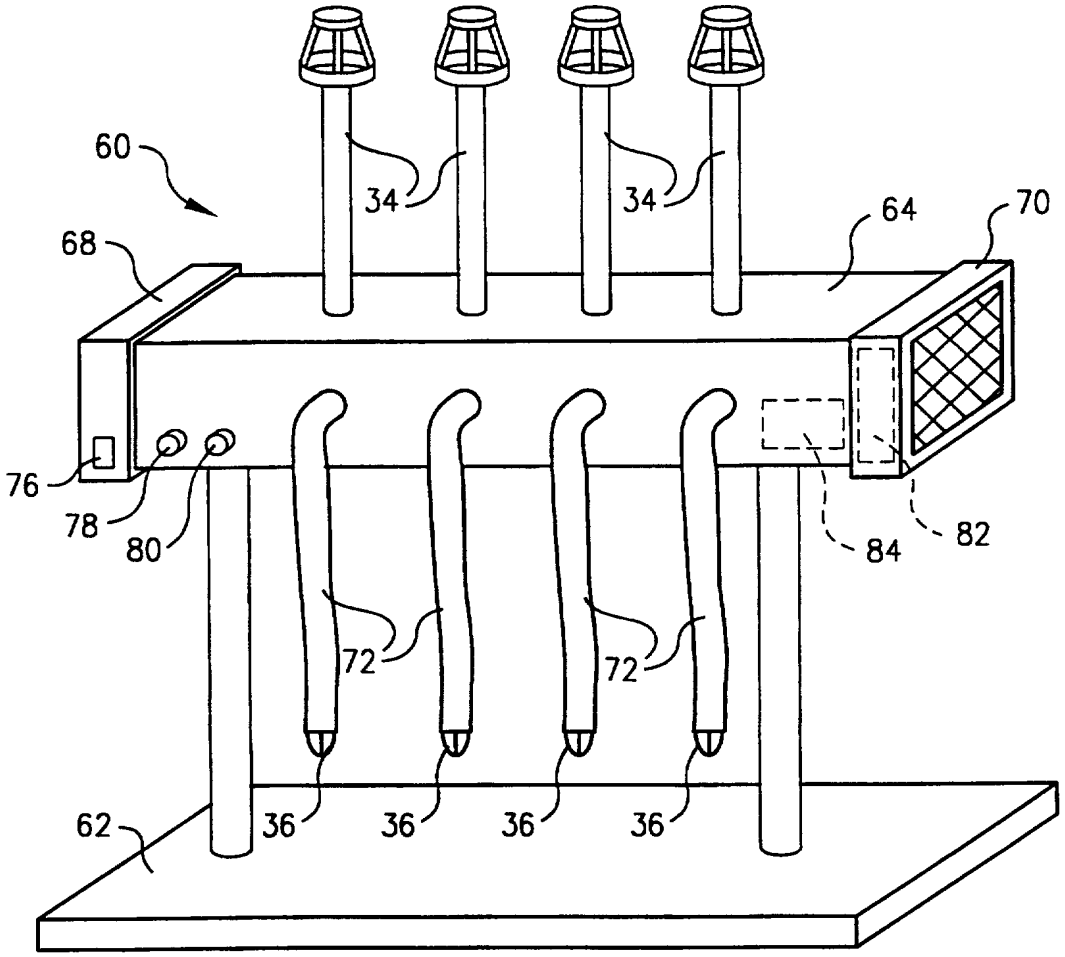
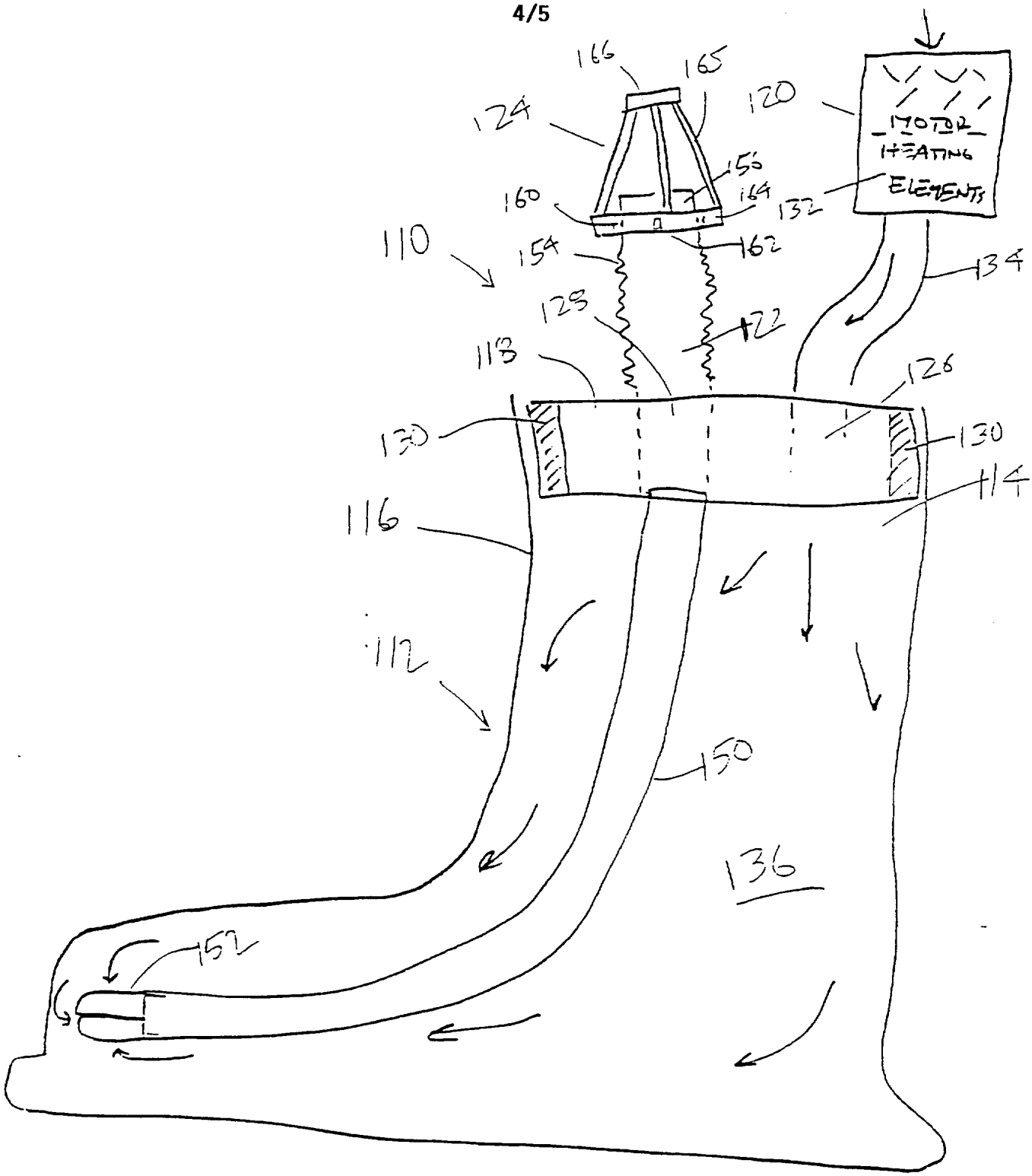


FIG. 3a

FIG. 4

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120
MOTOR
HEATING
ELEMENTS
150
160
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132
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134
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130
114
116
112
150
136
152

FIG. 5

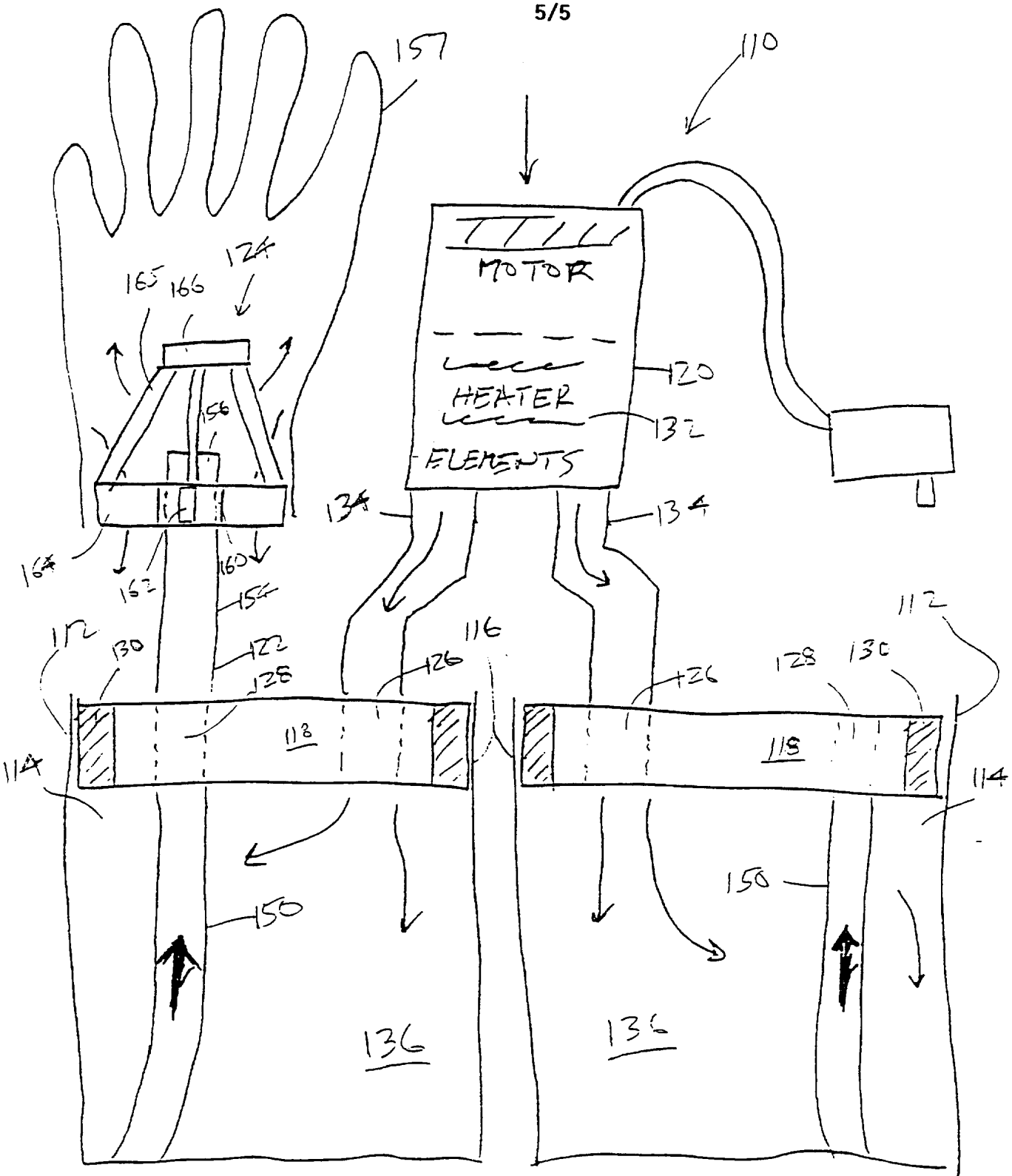
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FIG. 6

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TITLE: METHOD AND APPARATUS FOR DRYING FOOTWEAR AND HANDWEAR

PUBN-DATE: February 19, 1998

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APPL-NO: US09713206

APPL-DATE: July 25, 1997

PRIORITY-DATA: US02288996P (July 25, 1996) , US02309596P (July 25, 1996)

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EUR-CL (EPC): A47L023/20 , D06F059/04 , F26B021/00

ABSTRACT:

CHG DATE=19990617 STATUS=O>A method and apparatus for delivery of air to coverings for a

human extremity for the purposes of drying and warming the same. In one embodiment of the apparatus, the air is first accumulated in a plenum before delivery to the covering through a tube. In another embodiment, the apparatus has a seal at the opening of the boot or glove. The seal has an inlet port and an exhaust port. The exhaust port receives a flexible return air duct that leads to an interior extremity of the boot or glove. The exterior portion of the exhaust ports have risers with diffusers where gloves may be mounted for drying and warning purposes. The inlet port attached to a fan device in front of a downstream heating element. In accordance with this invention, air is forced through the entire boot, insuring that all areas within the boot are warmed and dried.